CCPI Workshop – Round 2

August 26, 2003

Mike Eastman, U.S. Department of Energy:
Okay, we're ready to launch the afternoon question and answer session. There appear to be a few more empty seats than there were this morning. I'm sure they'll join us but they're going to miss all the light. Let me start by introducing the DOE panel that we have with us this afternoon. I referred to this panel as the "A Team" earlier this morning, and I really am excited to have what I view to be key opinion leaders within the department with respect to this program, here participating with us this afternoon. Just to set the stage for the nature and the context of the discussion, this is not a policy setting arena. This is an opportunity to have an open exchange of ideas, the free marketplace of ideas concept if you will, where the level of understanding is increased on both parties sides, those of the potential applicants, as well as the Department, in creating the solicitation opportunity. So we have five panel members. I'll moderate the session. We'll have two roaming microphones in the room and it's critical that you hold your questions until you have the microphone in hand because we need to be able to identify the speaker for the record. A number of folks have asked me if the transcripts will be made public. In order to do that, I need to have a clear recording. So we will get to everyone within the timeframe that we have. What you're likely to see from the five panel members is anywhere from 10 – 15 opinions. We work hard at building consensus within the team when the issue requires consensus, but at other times we openly share our perspectives and viewpoints with the general objective of increasing the level of understanding among all the parties. I'm going to go down the row, then I'll hand the microphone over to Mike and Betty who will work the floor to pick up commenters.

Ken Markel, previously introduced to you earlier, our senior official if you will, is in charge of the coal demonstrations program at NETL.

Victor Der. Vic and I have worked together, I hate to say just how long that has been, but it has been since the mid 70s. If you can calculate it must mean that we were teenagers when we were working together! I won't tell you the program area, but Vic and I go way back and it is a pleasure to have him with us. He is the director, within the Office of Fossil Energy at DOE Headquarters, of the Coal and Power Systems Group.

Tom Sarkus is next. Tom and I go back not quite to the mid-70s. Tom don't worry about that but it is to the mid-80s.

Tom:
Well that's because I was born at DOE!

Mike:
That's true. So Tom and I were both teenagers in the mid-80s or thereabouts. Tom is the Division Director at NETL responsible for the implementation aspects of the Coal Demonstration Projects. Believe me when I tell you, he's seen every hang dog excuse there is relative to a project and it's performance or lack there of.

Lisa Jarr. Lisa is our intellectual property attorney. Lisa is our expert relative to the issues surrounding intellectual property and invariably there are issues. DOE has done this more than once, so her council is very sage both within the DOE team and what she provides back to the participants. Our objective is to get these projects in place, despite what your perception of our comments might be anywhere along the way. Lisa is a treasured resource with respect to intellectual property and I'm very happy she's here to participate.

Tom Russial. Tom is the NETL Chief Council and is very experienced in the Coal Demonstration Program. He was a teenager as well. Don't know how we were all so lucky to be completing our college education while we were working at NETL but I guess that' s how it worked! Tom is extremely experienced in the myriad of issues that surface relative to the structuring and conduct of demonstration scale programs and again

you really have a nice cross section of key opinion leaders with respect to many of the questions that I heard you all raise this morning.

My approach is going to be to start back with the slides that I presented earlier and then drill into the specific comments you all raised beforehand. From your comments, we created a couple of slides divided into general grouped discussion if you will, followed by the more specific ones. I'm hopeful we can get to all of the questions and we will characterize the responses verbatim to the degree that it comes out on the tape on the website, within a couple of weeks. Again I want to reinforce that this is not a policy making forum. There will be an opportunity to get specific formal answers and that will follow the release of the draft solicitation. The dreaded IIPS system, when the solicitation is available, comments back to DOE will come in through that system. To the degree that there are not company proprietary issues, the questions and the responses will be characterized and available for all to see. You'll get a specific point-by-point resolution once the draft solicitation is out. Before that time, it's a rich deliberative process where we make a best effort to produce a draft solicitation that we think is reflective of the community's interest and the national priorities. So without further adieu, we will get into the discussion format. I will moderate this session and some of the commentary may be for the record and I realize that. Others will be more suggestive that they would like a little bit of discussion and I will try to steer the conversation to the panel members, although many times my experience is that becomes like herding cats! I'm going to start by going back to what we presented this morning as it describes what DOE is looking for in Round 2.

A lot of discussion occurred this morning about this slide. Many of the comments we got were really trying to drill into this. My point for re-presenting this slide is to emphasize the DOE priorities. These are reflective of our current perspective. It's up to the audience to take a look at those perspectives and share any countervailing views or what-have-you, and again it will be all taken under advisement. You'll see what the result is when the draft solicitation comes out. But we're going to remain firm on this viewpoint today. There's only so much money and we see getting the biggest bang for the buck

being in these areas. I really just want to identify these as the ones we've identified as the priorities, but then also go back to the roadmap. If you're looking at alternative technologies to what we're indicating as priorities, then it's incumbent upon the applicant, coming back to Ted's [McMahon] presentation, to identify the competing technology, which would include say gasification technologies as they have been demonstrated, and viewed as "state-of-the-art" for comparison purposes. If you expect to fair well, then your alternative technology would have to meet the roadmap objectives and demonstrate a competitiveness relative to the baseline technologies. So I think at this point I'd like to open it up and have my portable microphones circulate. If anyone would like to comment on these technical thrusts, I think this is the core issue so we might as well start with, and keep working on this until all have had their say. It's an open microphone so who would like to venture out there first?

Bob Hennekes, Shell Global Solutions:
One of the questions I'd like to ask on behalf of the group is if they took the CCPI Round 1 initial request, could they use that as a go-by? You've been asking folks through the day to begin to prepare and in order to prepare, would the CCPI Round 1 be a good place to start gathering information and data so that they're prepared when the solicitation comes out?

Mike Eastman:
I'm going to defer this one over to our chief council. However, the short answer is yes, that' s our existing baseline, except where we've pointed out some specific things [this morning in lessons learned] where we're thinking about differences. But Tom would you like to take a pass at this?

Tom Russial:
I actually agree with Mike. The CCPI 1 is probably pretty close to the format we're going to use for Round 2. There will be some tweaks in technology areas and you might see some minor changes in some of the other provisions, but it's a very good starting point.

Mike:
Just to elaborate a little bit, I think both Sharon [Marchant] and Ted [McMahon] pointed out some areas where there was some general confusion in the proposing community. Project Definition is an example. We're going to clarify some of those things. The lessons learned we presented were primarily for the audiences benefit, but there were a few instances that when we looked at them, we said, "hey, we own some of these problems and we'll work on those." Thank you.

Bob Ashworth of Clearstack Combustion:
I agree with one of the gentleman here. I don't think DOE should be specifying what kind of technology you use. Gasification technologies is an example; you could just say high-efficiency technologies. I think it's probably not good [to be openly specific]. You probably hurt technology development by saying "this is it" [on a specific technology].

Mike:
I'm going to pass this one off to Ken Markel, but I do want to come back to the fundamentals here and we did take pains to revisit the consensus roadmap and the performance objectives therein. When we're looking at the next solicitation, we're clearly trying to reinforce those performance objectives and we pick a promising technology pathway beginning with the end in mind. That is why we've been focusing on gasification-based technologies. But I'll let Ken take a opportunity to express his views on this.

Ken Markel:
I can't disagree with what you just said. I think the end point is ultimately to look for technologies that are carbon management ready, that are compact, that are cost-effective when compared against technologies that are currently being used or have been demonstrated. In thinking about it, my humble single opinion is that gasification is a good way to do that. I'm not omnipotent, I'm not all-knowing and there's a lot of clever people in the world and there may be other ways to do it that we need to know about, but

clearly gasification brings together a lot of the elements that we're looking for. It's a prioritization more than it is an elimination, win or picking.

Sherwood Wilson, Ohio University:
I'll repeat the same questions I asked earlier. The first I'd like you to address, if you could, is the difference between a successful demonstration and a demonstration that's not successful in terms of 100% repayment of the Federal money.

Mike:
Let's take one at a time and then Ben Yamogata had his hand up next so we'll try to go there. Tom Sarkus has been intimately involved with the details of negotiating repayment agreements and the litmus test, just to kind of restate for you, our overriding policy principle in this respect is, that we need reasonable assurance of 100% repayment on a particular project. Then you're going to have to start looking at the details as to how do we derive that, how much is good enough, and I'd like Tom to take a stab at that.

Tom Sarkus:
Well thank you, Mike. We've talked about this a lot internally and among the DOE people there's a wide spectrum of opinions. I'll give you my opinion. I think what we're looking for is a reasonable possibility that we will get 100% repayment. We recognize that there are a variety of risks in every demonstration project. For example, there's technical risk. The unit may not meet its technical and commercial objectives, in which case it's quite possible certainly, with some of the retrofit demonstrations that we've done, that a facility may be dismantled and disposed of. Typically in those kind of instances we're not really looking for or expecting repayment as a requirement under those kinds of situations. Another example might be the Pinion Pine Gasifier. We never really got that one operational, so we recognize the technical risk and if the project fails to meet its technical and commercial performance objectives, then we're reasonable and we're not really looking for repayment. On the other hand, I really don't want to be approached by Vic or Ken or any of our other managers asking "well we just read a press release on company X and they sold over a billion dollars of Low NOx burners, how

much repayment have you gotten from company X Tom?" I have to look up sheepishly and say "not one red dime have we gotten from that technology." A similar situation exists for SCR technology where the commercial sales are what, on the order of 5 or 6 billion dollars. What we're saying is, that if the full moon comes out and it lines properly with the stars and you are fortunate enough to have a technology that sells like hotcakes, we want to get all of our money back. We don't want you coming in with a calculation or scenario where you have to get 500% of the market share or really even 50% of the market share. It's unlikely, in my estimation, for any of your technologies and I know that we all get attached to them, but it's really unlikely for any of your technologies to get more than a 20 or 30% market share. So if it sells well and you make money, we would like you to be kind enough to direct some of that money back to the people that helped you in the beginning with your first commercial demonstration.

Mike:
I'd like to add that in the evaluation of the application, the repayment agreement is something that gets specifically evaluated and scored. So what typically we like to see, which turns into higher scores, is an appreciation of the impact of the technology at the demonstration site. If there is a revenue making opportunity resulting from the initial application, then we like to see a piece of that action. Then if you look at replication, there might be several different parties involved with technology, and we like to see participation of subsequent sales resulting from successful demonstration. Then it's up to the applicant again, whatever is proposed, but then that's what DOE looks for in terms of evaluating and distinguishing between "so-so" proposals and others that score higher. Any body else on the panel like to chip in?...No.

Sherwood Wilson, Ohio University:
The crux of the question that I have this afternoon involves what I perceive to be the priority of the Department of Energy in the CCPI solicitation and that they're focused almost exclusively on the power generation industry. I understand again that this is a clean coal power initiative, but there's a whole segment of industrial institutional boiler operators who find themselves really in a very tight spot, and in fact of the 95%-5% split

between coal being utilized for power generation and not, I suspect that that number is rapidly becoming 96/97% power production because the industrial institutional boiler operators are being forced to switch to natural gas. So the share of the coal production being used for other than utilities, by the very nature of the industry, is dwindling. It seems important to also focus on the 50 MW or under sized application for gasification, fuel cells and so forth. There's a substantial market for that and the potential to exponentially go from 50 to 500 is significant. There's a very wise person in the room who said that a mighty oak is felled one chop at a time, or it's grown by one little acorn. It seems to me that we're really losing sight and missing a significant part of the country who deal day-to-day with the old coal-fired boilers that are having to migrate to natural gas.

Mike:

First, let me thank you for so clearly articulating the issue relative to distributed generation or industrial applications versus utility-scale applications. I think it is a material issue in terms of the interest of what has traditionally been and continues to be the focus of our efforts here. We are part of a bureaucracy and there is a structuring of missions and programs to accommodate these various priorities. It's our interpretation of what the priority is for the CCPI that's driving us to the message that you're hearing. But I'd like to hear some additional commentary. Ken Markel, I think, could share some views as to rationalizing where we are.

Ken:

No, I'm not going to rationalize the department's position. Not with our headquarters folks sitting next to me. I'm going to react, because as I was listening to you, I had two thoughts come to mind and they are kind of conflicting. One is that there are, number-wise, a lot of small coal-fired industrial applications out there but if we really want to get a big bang for the buck in terms of the program objectives, which go back to the mercury, Clear Skies, and ultimately a carbon management strategy, we're not going to have a big impact, even if we hit 95% of those. And therefore, something falls by the wayside. It's just kind of saying "where can I get the most bang for my buck" in terms of meeting

those long-range objectives. In fact, that might be the best place for a gas-fired unit, rather than putting coal in it. We can talk about that and I'd like to carry on the conversation in a more give-and-take environment, but off the top of my head, DOE has just got $300 million and wants to ultimately end up with carbon management friendly technologies. I'm not going to do a whole lot in that regard, even if I do include all of the industrial coal-fired boilers.

Mike:
Any other contributors from the panel? Okay thanks very much. Ben you were next.

Ben Yamagata, Coal Utilization Research Council:
Mike, you made reference and a number of your panelists have as well to the Coal Technology Roadmap and I hope you'll give our audience a site, presumably on your website, so that they can get the entire copy of the roadmap. My question goes to your comments about carbon management, Ken. By that, do you mean a concentrated stream of CO_2 or are we talking about something else? And the second part of that question for those anticipating doing something in this area, are we talking about capture, which is what you're looking for, or are you talking about capture and disposal?

Ken:
The something else seems to hang in the air, so I'm kind of curious as to what the something else might be other than CO_2 concentration. Did you have something else in mind?

Ben:
I didn't. I wondered whether you did.

Ken:
I'm a pretty simple guy and you've got to concentrate it before you do something with it. Otherwise, it gets to be expensive. I'm not saying there isn't an alternative, but looking toward carbon management to me would include separation, concentration, and

ultimately some disposal opportunity. Looking toward it doesn't mean you're going to have all three of them all at the same time that are ready to go. Separation, concentration and disposal though are all elements of carbon management. Nothing else comes to my mind.

Mike:
The only other aspect of the question is in the roadmap, the efficiency targets. There's an increasing direction for improved efficiency and it goes hand-in-hand, large quantities of CO_2 have to be managed, improving efficiency cuts down on the quantities involved so there is a strong relationship to the efficiency aspects as well. Ben, you asked about the roadmap and its availability. Certainly it's available at the CURC website which is found at www.coal.org. NETL has been doing some work on the roadmap and readying it for publication on the NETL website as well. There are a few glitches and some additional clarifications that may make it a little more user friendly and we will have it up on the NETL website in a couple of weeks. I think we had a question down front here.

Sid Nelson, Sorbent Technologies:
Getting back to the reimbursement issues, I'm sure you understand that you're really kind of setting up a bit of a perverse incentive structure here where as a technology developer, we have to look, at do we try and get DOE co-funding, which if we're successful is really simply a loan, or do we try to go outside and avoid all of the red tape and the reporting requirements in that structure. And we have to make that decision as a corporate decision. If you require the technology developer to repay, what is usually primarily a permanent installation someplace and equipment in someone else's facility, that you are going to not attract those technologies or projects that are the most commercially viable and have the best prospects, but instead perversely you're going to attract the ones with the highest risk or the ones that don't necessarily anticipate a high chance or probability of reimbursement. So I was curious, if you'd kind of address that perverse incentive and how you might be leaving some of the ones that really need the oomph that would accelerate things, you might be leaving them behind.

Mike:

Well, I think we've kind of covered our perspective, but any additional bites of the apple from the panel? Tom Russial has been really engaged in the details of looking at proposed repayment agreements and finding pathways to go forward, yet preserving our overall objective to have reasonable assurance of full repayment. I believe we can caveat, assuming successful demonstration, on the end of that. Having said that, Tom…

Tom Russial:

Just a couple of points. For those of you who have been involved in the Clean Coal Technology program from its beginning, you probably have seen the change in the CCPI solicitation. The repayment agreements were modified to allow different bases of repayment. There's a lot more flexibility in how you may structure it. It doesn't necessarily have to come from the technology developer. Whatever makes sense for the project, however you want to structure it can be fine with DOE. It doesn't have to be on a set formula like it was in the past. As far as the loan, I agree. If you're looking at repaying it, you could characterize it as a loan from your prospective. It's a good loan, there's no interest on it and you might not have to repay it if you're not successful. Take a look at the provisions in the repayment agreement itself. It does give you a lot of flexibility on how you want to structure your repayment agreement.

Tom Sarkus:

I don't really know whether to throw this argument out there or not but some of our participants have recognized that rather than being a bad thing, because we've had public meetings ever since the first clean coal solicitation and people have always jumped on us, we don't like repayment, we don't want it. But if you didn't have the repayment requirement then the DOE funds to you could be characterized as taxable income. So there's actually a very strong advantage for you in DOE having this repayment requirement in the program. And to repeat what Tom said, it doesn't have to come from the technology vendor. Now, I recognize there could be some very contentious discussions between the host-utility, which is getting an asset and the technology vendor. And there may be in some cases, two or three other parties involved, so how exactly you

divvy that up is up to you. In some of the creative approaches that we have seen, the repayment does not always come from the technology vendor.

Vic Der:
It's probably worth just reinforcing the notion of repayment as being a priority of this administration as well. I think Sharon [Marchant] touched on this as did Rita [Bajura] about the business base of the operation perspective of government operations. So this gets back again to a successful technology, comments that Tom [Sarkus] made that if the countryside is littered with this successful technology there is every expectation that the government has fully recovered it's investment as being only fair.

Tom Sarkus:
I don't mean to beat the dead horse, but Vic reminded us that this is a legislative mandate. This is in our legislation that we must seek repayment. And I have been placed in some of the most uncomfortable positions I've ever been placed in, in these discussions of repayment. One time, our DOE Inspector General came into my office, and I don't know why they generally seem to find my office, and they wanted to know why haven't we gotten more repayment. So I gave them the song and the dance and they said they wanted to talk to some of the participants. So they got their airplane tickets and they visited some of our participants. And then they came back and said you know what Tom? We talked to one of the participants and they literally boasted to us that under the terms of the early repayment agreement that was negotiated many years ago, they will never, ever have to pay DOE a red cent. Now if you can place yourself in my shoes, and imagine what it's like to be sitting at my desk and having an inspector general telling me that and pointing the finger at me for our program, you can see our point. Additionally, there was one situation where a rather persistent newspaper reporter asked the question and since I knew the answer, I tried to evade it, but ultimately I gave him the answer and it was how much repayment have you collected through the program. And for the record, the number is a little bit under two million dollars. He then did a quick calculation of what the total value of all the clean coal programs were and he wrote it up and he said you know what? This clean coal program, despite all the successes that Janet [Gellici]

and Rita [Bajura] and others said this morning, this clean coal program has been a failure and a boondoggle because it's only garnered repayment on the order of one tenth or two tenths of a percent of the total federal investment. That was picked up by the news wires pretty quickly and I learned about it because I got a phone call from Washington alerting me to the fact that it had been picked up on the news wires. Again, we've got to do a better job folks. It could point to 15 to 20% collection record in terms of repayment, we wouldn't be in the predicament that we're in. But when I can only point to a tenth of a percent, and again from day one people have been fighting repayment, complaining about repayment, trying to roll us and work us over in negotiations, and then turning around and boasting about it. That's water over the dam, but we can't do that any more. We're really being held accountable and you know what? Sharon said it very clearly in my mind this morning, when we pick a proposal, we're not just picking the best technical ideas. Trust me. There've been some very good, some excellent technical ideas that have failed on business, financial grounds, and that includes repayment.

Vic:
I'd like to add to what Tom is saying. That number 1, it is a legislative mandate and until that mandate is changed our hands are rather tied and we owe it to the taxpayer to get as much back as we invest from the government side. That said, we also recognize that the value and benefits of this program go beyond the repayment to the government. We all know that. But unless that legislative mandate is changed, we have no other recourse and I guess the industry collectively has to make a decision on whether or not this is an insurmountable hurtle and do what you have to do.

Ken:
I going to put my two cents in. The way I think about it you characterized it very well. It's a cut point. We're looking for those projects which just can't go out and get bank financing. But not those things which are great risk because we want successful projects. It's a fairly steep curve and if you get too far on one side or the other it doesn't fall within the confines of our intent here. You're right. It's a narrow path and the challenge is to prepare a package or a proposal or a partnering with somebody that falls within that

narrow range. That says this technology or project is really good but I can't get the banks to talk to me about it but I've got all this good support data that says, yes, it's ready to go. That's the difference we're trying to make up.

David Stopek, GTI:
There was earlier discussion about industrial-scale demonstrations. If we look back at the history of the clean coal program itself, some of the earliest projects from the historical prospective are some of the fluidized bed boiler demonstration projects that were demonstrated at utility scale, in Colorado and the TVA and so forth. However, when the technology actually came and was sucked into the marketplace, it was not the utility companies who came in and commercialized the technology. It was IPPs, small boilers and industrial applications where most of these facilities have been built and they have been under 100 MW, some below 50 MW. But I think it's difficult to say that commercial demonstration at that scale is necessarily wrong because as we've seen, fluidized bed boilers are indeed a commercial technology. It doesn't mean there's not more research needed to improve it. Hell, we're still doing research on PC boilers. But the point is, I think you have to take a look at the overall view and not necessarily say that we can't demonstrate it at a 20-50 MW scale and that it won't be applied and make a big impact later.

Mike:
I think that was a comment for the record and I will accept it as such.

Steve Jenkins, URS:
Let me go back to the question I asked this morning just to get clarification. On the technology roadmap, is there a place on that roadmap for going toward zero emissions particularly in CO_2 for the existing 300,000 MW of coal-fired fleet versus new technology such as gasification. And if so, is there a place in Round 2 for demonstration of CO_2 capture and that's capture without sequestration or disposal for CO_2 capture only technologies that can be applied to existing coal-fired power plants.

Mike:

I'm going to take the high road before I turn this over and just to restate the objectives of the underlying core R&D program. The objectives, if you will, include all forms of energy systems from coal to be such that we accomplish an economic disposal configuration for all of those systems. I think our priorities in terms of the expression therein, is where are we likely to get to sooner rather that later? Looking at say gasification based systems as delivering a stream that is more amenable to economic disposal than a more dilute stream, not to say that it's precluded just in terms of what our priorities are. But as I gaze down the row of panelists, is there anyone who would like to chew on that for a little bit?

Tom Sarkus:

I will. I think the simple answer is yes, we're interested in CO_2 capture. But in the back of my mind we had a proposal once upon a time that suggested CO_2 capture and they weren't really doing anything that wasn't already being done in another industry. To take CO_2 that's coming out of a rectisol unit, that may be what refineries are already doing in petcoke applications and to want to do that on a coal gasifier, that's not a real stretch. So we are interested in capture, but we're interested in capture that raises the bar compared to what currently is out there today.

Ken:

I don't know where you were going but I think demonstrating separation, the project itself has to be contained in a way that's a total project. I mean, demonstrating separation and then just releasing it's not going to work. That may have been obvious but sometimes it is worth a clear statement.

Bob Ashworth, ClearStack:

I forgot to ask one question. We're working with the utility and a memorandum of understanding with them for a 50 MW demonstration. Our technology right now, we are targeting for 200 MW and less because most of the larger units have SCR and scrubbers on them and we have a cheaper way of doing it. But I was just wondering, and so we're

targeting those units which you really can't afford to put SCR and scrubbers on. So would a 50 MW demonstration qualify for this solicitation?

Mike:
Thank you. I think this is one where we can provide a pretty definitive answer. I feel comfortable in that. Who would like to share?

Ken:
The answer is sure! You asked one dimension of a multi-dimensional problem. I'm a little sensitive now about small industrial sized applications. But yes, that's not going to eliminate it from being considered.

Mike:
I'd like to just reinforce the idea, go back to the national impact. We're talking about electric power from coal. So if what you're talking about is a power plant that would be providing electric power and having a technology where they identified a specific commercial market target, that would have national impact upon the electric power production capacity of the country, then, I think it easily fits within the scope of the program.

Bill Renner, EnviRes:
Does the proposal need to include the long-term generation or demonstration of the ability to generate electricity or can, in order to maximize the projects ability to repay the DOE, can you have a temporary demonstration of electricity? I'm in particular thinking about a market where there's not a significant demand for current production of electricity. Can you have a temporary demonstration of the ability to generate electricity from the technology?

Mike:
Let me ask a clarification on that. Is the question that if we have a demonstration period that the "temporary" aspect would not mean 10 days out of a 3 year demonstration period

but it might be for the substantial portion of the demonstration period? Is that your intent?

Bill:
That's correct.

Mike:
Okay, thank you. Tom Sarkus, we'll let you chew on that one.

Tom:
The easy answer is yes. The devil is in the details and a lot of times we don't really know the details and we can't react to them until we start the proposal evaluation. With some of our pollution control projects in the past, you know they were tried out and some of them worked well but maybe weren't super-economical. So some of those facilities were dismantled. Others have been mothballed and they're still just sitting kind of idle. That's a lot harder to do and a lot more expensive when you're talking about a power generation facility. It's kind of painful to have an asset that costs as much as they do, sit idle and not really be put to productive use. So on the one hand, we would certainly entertain something like that. On the other hand, I'm kind of struggling trying to figure why that would make sense.

Bill:
I guess what I was specifically referring to is not necessarily the actual production but utilizing the gas stream from a gasifier to run into one burner that would just demonstrate the efficiency and the ability to generate electricity, not necessarily turn the turbine and generate electricity. Just using a IGCC burner.

Mike:
And when that's not running you would be producing other valuable products?

Bill:
That's correct.

Mike:
Yes, something like that we certainly like. It fits in with flexible product slate so I don't really see a problem with that. I'm sure there would be a lot of discussion about if you produced 2% electricity or 5% electricity or 30% electricity where again is the cutoff point? But we would certainly entertain ideas like that.

Ken:
Can I disagree?

Mike:
Sure!

Ken:
It sounds, and here you've got a difference of opinion and as Tom said the devil is in the details, but my gut reaction to it is that it sounds like a pilot test not a demonstration. It's kind of, in a way a slipstream rather than an actual integrated commercial application. But that's a difference of opinion.

Mike:
The other thing that worries me about a non-integrated kind of demonstration is the challenge. We have two essentially coal-based gasification utility-scale units operating in this country. The challenge is to get more on the grid at an economic dispatch. If you're arguing a mine mouth application, and it's not going to produce electricity, then the onus on the applicant is where does that leave us? Have we materially raised the bar so that that technology is a step closer to being economically dispatched if it isn't so demonstrated as a result of this investment. I think there's going to be some serious questions asked in the evaluation process relative to that. So I know you got a gray answer there but the other thing I could go back to is when the draft solicitation comes

out you can be very specific about a question like that if it's still unclear in your mind and you will get the best answer that we can document back to you on that question.

Bob Horton, ChevronTexaco:
My question is actually a request for clarification on eligibility of certain project costs for cost-sharing based on the timing of when those costs are incurred. For a project that's a winner, that actually signs a cooperative agreement and goes forward, clearly in the post cooperative agreement time period the project cost should generally be eligible. But in the time period say between selection and signing a cooperative agreement, or the time period prior to selection, can any of the engineering, environmental, business development costs be rolled into the cost-sharing formula?

Mike:
The answer is yes but it's a conditioned yes. There are practices and procedures and authorizations that are required. I'm going to pass that down to Tom Russial. That is a contracting officer's roll so you don't need to be uncertain about this. Tom.

Tom:
Actually Mike, the questions was, can you reach back before selection and the answer to that has been "no." We don't reach back before selection.

Bob:
Okay but post-selection, pre-contract.

Tom:
For the post-selection, pre-contract period, the contracting officer can give a pre-award cost authorization. Those costs are incurred at your risk. If we don't get to award, it's to your account, but once selection is made, and we typically do that, it's a fairly routine practice to recognize those costs (assuming the pre-award authorization was granted).

Mike:
We typically do it. It's something that needs to be requested and there are terms on it. It is a specific process to go through. There can be a pre-award cost authorization, but it's not automatic. You don't defacto have it. It must be a specific act.

Bob:
Thank you.

Doug Todd, Process Power Plants:
I'd like to understand a little bit more about the CO_2 capture desires for Round 2. In some of the slides it kind of indicated that CO_2 capture was important by 2010. In other ones it showed it really didn't occur until after 2010 to 2020. And on top of that, we discussed this morning the FutureGen program which is the big place to do capture and sequestration. So what I'm interested in understanding is the incentive for an applicant to do something before 2010 on capture, slipstream capture to prove a technology because there isn't enough money to pay for the sequestration, a shorter time frame for the slipstream capture, or is there no incentive to do it before the 2010 time frame? How are we going to evaluate that?

Mike:
In essence, I understand your question to be "is there a priority of DOE to look at CO_2 capture and sequestration in Round 2?" Is that the essence of your question?

Doug:
Yes, if you mean Round 2 is really for plants before 2010.

Mike:
Yes, I think that's a fair interpretation. The moderator is looking to his panel…Maybe to warm them up a little bit we could revisit FutureGen and the relationship of FutureGen, the R&D program and the demonstration scale activities of CCPI. FutureGen is an R&D platform, fundamentally that's what it is. It may produce commercial technologies or it

may not. The CCPI program is principally directed at readying technologies for commercial deployment. One could consider Enhanced Oil Recovery (EOR) uses for CO_2. I'm going to pass to Ken to elaborate. And then perhaps a few comments from Vic on FutureGen would be helpful.

Ken:
Let me do a couple of suppositions. The carbon management may not simply mean stick it in the ground. We currently have a project looking at EOR as a way of dealing with carbon, which produces additional oil. Tying projects together across fuels so to speak, across industries, offers opportunities before 2010 for capture and management of the carbon other than sequestration. And the other half of it is, again this kind of portrays a bias, if in fact IGCC is a good path to ultimately achieve effective carbon management, we need IGCC options to deal with. So Round 2 looking at advanced gasification technologies as a means to be on the path toward carbon management, while not including carbon separation and control. So there's two answers I think to your comment. One is carbon management in the context of something other than just sequestration, EOR for example, certainly it is a possibility today. And then other components in and of themselves can be an integrated system but which move toward carbon management in the long term, is the second. There may be others too, but those are the two that come to mind.

Mike:
And I come back to the technology push perspective. We need to be, in whatever is proposed, advancing the state-of-the-art. So commercial practice, if you will, I would think would be of little interest to DOE in CCPI. But if there's something novel, innovative where the state-of-the-art has been improved on, either cost performance, separations performance, what have you, then there would be an interest on our part.

Sherwood Wilson:
This is for Mr. Markel. At the risk of beating a dead horse here, I'll make this last comment and that's it. Industrial institutional boiler operators found themselves in a real

dilemma without having anybody to champion their cause, and in the world that we live in, and IGCC or CHP plants have significant thermo utilization and it can be the difference between switching to natural gas and continuing to burn coal. If there's no champion for this group of users, then where do we go or what choices do we have? Now, in Ohio we're very fortunate to have the Ohio Coal Development Office. They are very forward thinking and really do look at this size of constituent. But would it be possible, you know in the 60s our country has made it a national policy to do set asides for small businesses and minorities, maybe the DOE should look at a similar kind of policy and set aside a small portion of the CCPI funding for non-utility type installations.

Jackie Bird, Ohio Coal Development Office:
Sherwood threw me in the pool so here I am. Let me just add that anecdotally for the last several months we keep getting these kinds of phone calls from industrial-commercial sites that are desperately seeking something for the smaller scale user. Some are actually looking at smaller scale gasification, some are looking at hybrids, and it's across the board. Whether CCPI is the appropriate venue for this particular niche, maybe it is, maybe it isn't, but your point is well taken that it's not necessarily the bang for the buck that you're looking at in this particular program. But where is that niche that can be satisfied in DOE's overall programmatic areas looking at the entirety of the whole. There is this smaller segment that is there that very much need some sort of development assistance. And I might add, that while it may be a small ROI in terms of the dollars and cents on the paybacks and the other sorts of things, they also need to look at these smaller applications that have some pretty big local economic impacts. There are some pretty big effects on the ground in the local areas. You might want to roll that somewhere into your overall program and take a look at that. Thank you.

Mike:
Thank you. No question that I'm looking down the panel that there are a number of these points that we will discuss before we come out with the draft solicitation. Some may lead to impact on the solicitation itself, others may lead to impact in other aspects of the

program. But that's one of the purposes of why we're here today. Unless somebody wanted to add something to that I was going to go to the list of specific issues.

Rita Bajura of DOE. Would you discuss foreign participation?

Tom Russial:
There's a number of provisions that have appeared in the solicitation dealing with Buy American and that type of provision. I'll try to tick them off. First I should probably say there is no absolute prohibition against foreign participation in the program. There are provisions in the solicitation that are required by law. It says that to the extent practical, American made equipment should be used. There's also a provision in the solicitation entitled "Buy American Act." Again, it's dealing primarily with the use of American made products for the project. You have to read that provision very closely to see it's applicability to the program. But there is no absolute prohibition against foreign team members, even foreign companies, except in a very rare case that we haven't seen so far, for applying for an award under the program.

Meyer Steinberg:
I'll ask this question again as I did before lunch. Is there any role for universities or national laboratories under industrial sponsors that might answer these solicitations?

Tom Russial:
I guess that one's mine too. The last solicitation, and I believe the one before that in clean coal, did allow national laboratories to participate as team members. National Labs can't be a prime and the next solicitation will say the same thing. But they can be a team member and anybody who's dealt with the national laboratories before knows that there are some policies in DOE about when a national lab can participate – not competing with the private sector, not overburdening the lab for this work. Our practice is to carve out the national laboratory work, if it's included in a selected proposal, and fund our share of the money to the national laboratory through the operations office and then the other share of the money would have to come from the industrial participant. There are some

advantages to the industrial participant in doing that. But again, they can be team members.

Meyer:
What about universities?

Tom Russial:
There's no limitation on universities participating. They can be prime, they could be team members.

Mike:
I'll take one more question at this point from the floor and then I'm going to go back to some questions that some folks asked before lunch. We did try to capture those and we're going to work our way down that list. Just to let you know that we were listening.

Steve McKanna, Pacific Rim Energy:
On your point system, does it matter if the facility is 50-60 years old or 20-30 years old?

Mike:
Well, while they're thinking, I'll say, that's it all about the market. So Tom would you like to chew on that?

Tom Sarkus:
My preference would be for the 20 or 30 year old facility, and the reason I say that is I've got an example of an old proposal rattling around in the back of my mind where technology was proposed for a boiler unit and it was even stated in the proposal that the boiler would be retired immediately after the one year demonstration period and we were wondering why the proposer could not have found someone who was interested in actually using the technology rather than someone just saying, yea we'll let you put it on this expendable boiler before we put it out of it's misery. So I don't think we would totally preclude a 50 or 60 year old unit, but being that they're older, and generally

smaller, I don't see as much advantage generally with them as you would with a 20 or 30 year old baseload unit.

Steve McKanna:
Other things can go wrong.

Mike:
Some of what you're talking about is if we were looking at repowering a unit like that and revitalizing that aspect of its contribution to the grid through advanced technologies, that's one thing. But if it's use it and throw it away, then we're left with questions. For example, is there really a market for this or is this just spinning our wheels?

Tom Sarkus:
That's a great point, Mike. On the Wabash IGCC project that was featured this morning, we did repower an older plant that was, I understand, 31% efficient and Wabash is getting like a 40% efficiency now. That's a great thing and those old steam turbines are very robust. So that kind of project is of interest.

Mike:
Okay, I'm going to take a look at some of the questions we got this morning while you folks regroup a little bit. We'll chew on these. I'd like to thank Charlie Drummond with NETL. He collected our notes and tried to capture the essence of the comments. Hopefully, we did them justice. I'm just going to work down the list.

1. Must the project produce electricity? I think we've pretty much drilled into that and I don't propose adding any additional discussion on that point.
2. Are subscale demonstrations, 10-40 MW acceptable? Again, I think we've tackled this one. I had a little more specific conversation over lunchtime dealing specifically with fuel cell technology and what scale would be appropriate for fuel cell demonstration. And I'm going to go back to the roadmap and talk about high efficiency objectives. I think it's clear that to reach the higher end of the efficiency targets, fuel cells can play a key role. So their maturation through the demonstration

program is important. But at what scale do they need to be demonstrated to leave them ready for commercial use? I think that plays back to a question like this too. It is on the applicants shoulders to demonstrate the validity of the proposed scale of the demonstration. Anybody on the panel like to take another pass at that? No…okay.

3. Will future rounds include NOx and mercury control technology? Well I'm losing my voice, conveniently so, and anyone on the pane?

Tom Sarkus: I'll field that one. We've had a lot of discussion, and again there's something of a spectrum of opinions on the issue, but when you look at the compliance regs and the deadlines for NOx, and they're different depending on what state you're in and so forth, but for NOx you're looking at a lot of compliance deadlines in the year 2003 and 2004. And they are getting down pretty low. Probably be another series after that, in a few years. It's going take you even lower. So we think that the door for NOx is going to be closed. I don't know when, within a few years. Will it be in time for Round 3 I don't really know. But we do see that door closing first. With regard to mercury control that door is closing too. We don't have regs yet but they're on the drawing boards. EPA is going to roll them out and it's kind of like with SCR systems, the utilities start installing more and more of them, there's less of a window for us to demonstrate new NOx control technology options, and eventually a similar scenario, I think, is going to play out with regard to mercury. But, mercury, I think, is going to be around, it's pretty safe to say, Round 3 will probably entertain mercury control. But will subsequent rounds, I don't know. I know I'm being a little bit vague but I'm trying to give you a feeling that we're trying to map out these uncertainties in our own minds, just as Rita could not give you a definite funding answer because of the budget process, I can't give you a definite answer because of the regulatory processes. But we do see the time window for demonstration and certainly for widespread commercial deployment, which takes years after the demonstration, those time windows are closing for some technologies.

Ken:

Looking at it the other way, it just reinforces the need to focus on those kinds of issues in this round because this is our opportunity to have an impact. And whether it's the 150 MW or the 500 MW unit, it's the same issue. They are the focus for this round, because windows are closing.

Tom Sarkus:

And it's also important to describe the breakthrough? I have to kind of identify myself as I'm the scrubber guy in the group. I used to work in SO_2 control so I've kind of gone through that. Within the department the interest in these technologies kind of dissipates before it does in industry because we're by and large R&D folks. Industry may still be wrestling with compliance installations but at that point it's no longer high interest to DOE, it's kind of moved off of the R&D table before it goes on to your compliance plates. What you will need are breakthroughs. SO_2 control, we demonstrated 95%, we demonstrated 98%. Would 99% or 99.5% be worthwhile? Yes probably, if you could do it at substantial cost savings. And the same thing for SCR. A lot of times people hold out SCR and the papers I read, claim 90% NOx removal. Then I go around and talk to the people at the power plants where they're installing these and they're saying you know what? We're really getting 70% or maybe 80% at best. So is there a possibility to demonstrate a 90 or 95% SCR system? I think there is, if you can do it with cost savings. But again, there are people on this podium and within DOE who would disagree with me on that.

Mike:

The one caveat that I would offer is that this discussion really has focused on existing fleet applications and when you look at the roadmap there are aggressive targets for the future energy plant designs. So the degree to which NOx and mercury are driven lower leading to the zero emissions plant, there still is a continuing interest in control of those aspects to lower levels. So there's a couple ways to look at that question. I presume this is a follow up to the discussion?

Audience:

I was the one who asked the question on future funding for NOx. Going on the table that you have for now and 2010 and 2020, you show close to a .01 balance of NOx per million Btu. I am assuming if you go to gasification route it's easy, and if you look at the current fleet, you are running into trouble. So keeping that in mind, and if SCR cannot go down that much what are you going to do?

Mike:

Clarification on the roadmap. There are 2 specific branches to the roadmap. And the tables that were presented dealt with the future energy plant system and there are specific targets for NOx on existing fleet applications. We just didn't present those at the same time. They are not quite as aggressive.

Mike:

4. Is any relief from EPA requirements possible?

Ken:

Is Doug Carter in the room by any chance? I could punt this one over to him. I'll watch our environmental folks to see how much they squirm to see if I'm getting this right. There is some relief in EPAs regs for clean coal technology projects. These [CCPI projects] are considered clean coal technology projects for the purposes of those regulations. It's relief for NSPS, PSD and NSR. It's limited though. Probably only applies to retrofit projects, only applies if you're not increasing any criteria pollutants, doesn't trump state regulations, so I'm not sure how much utility it's going to be for most of the projects that we do see. Some of our clean coal participants have been able to take advantage of it. We put out a guidance document or at least a white paper on this for the last solicitation. It may still be posted on the website. It's a very good document. It goes through what the exceptions are, outlines how they apply. It would probably be a good idea to put that out again for this solicitation.

Mike:
I'll take that as an action to put it on the CCPI website as a part of the proceedings from this workshop.

5. Do two pieces of a plant need to be at the same site? Well, I'm not sure. Let me just take the example of an existing demonstration project more out of necessity than design. We took a fuel cell demonstration that was part of a specific project and in order to keep the fuel cell portion on as fast a track as possible, it was separated from the development of the main body of the project itself and relocated to another appropriate demonstration site. But that was more of a make do than what I'd like to see to be a specific design. But having rambled a little bit, giving the panel time to mull that over, any takers?

Tom Sarkus:
I'll put my foot in my mouth once more. I feel awkward because I'm speaking in vague generalities but more often than not, multiple sites are probably going to be perceived as a weakness. It may not be a fatal weakness. There are good examples of having multiple sites. We felt that the fuel cell was a very innovative part of that demonstration and in order to get that on the demonstration block a little bit sooner, we made that particular decision. There've also been a couple of software kinds of projects. I remember we had one called the Coal Quality Expert and it was a computer model that related coal type and boiler type to boiler performance. With a model like that you want to have data from as wide a population sample in terms of coals and boilers as possible. So with a software kind of project like that, sometimes it makes very good sense to have multiple demonstrations and in that case it would be a strength. But for most of the ones that I've seen, it's perceived as a weakness that you can't integrate or combine the demonstration and find one commercial site that's willing to take a bite at the entire apple.

Mike:
One thing that might help is the person who asked this question, if we could get a little clarification as to what they were specifically interested in, it might help.

Irven Miller, Kreateck Division of Reaction Sciences:
I was thinking in terms of a methanation plant where the output at that plant was sold to an existing combustion turbine facility. And the methanation plant could be mine mouth or somewhere else, but using an existing combustion turbine facility for the output of the methanation plant.

Mike:
Hey, I'm just the moderator. It doesn't sound like you've got two sites to me. It sounds like you have one site and a customer that's using the product. Maybe you have more than two sites. Tom.

Tom:
I don't really know how quite to react to that one. You're demonstrating the methanation at one point then you're transporting the product to an end user site somewhere else. We've had projects that do that. One that comes to mind is a coal gasifier at Tennessee Eastman in Kingsport. Air Products built a liquid phase methanol reactor that converts the syngas into methanol. Now on point of fact, almost all of that methanol is used right there at Kingsport in Eastman's Chemical Plant but some of the methanol was taken and tested in vehicle fleets, in fuel cell applications, was transported to distant sites to complete the testing. In that case I think you actually made for a much better demonstration project.

Mike:
Let me react to this too having seen a lot of different project concepts. I'm going to get back to raising the bar. So if the one option would be a proposal for producing a methanated product and then it would be marketed and disposed of in some indeterminate way as opposed to a specific project that had a user site hooked in as part of the project team and the data that came out of it was part of the demonstration project and there was something of value, something new in terms of this product's use and particular turbine that had widespread applications, I think you're building a stronger and stronger

application in that respect. So fundamentally, I don't see any prohibition to doing that and in some cases it may lend itself to linking yourself more directly with the market intended as part of the project, which would be a strength. There are some general questions also. I think they're on the next slide but there may be some folks out there who are chomping at the bit to have it reopened to questions and I'd be happy to start that process again. Are there general questions? No…I'll move in business specific ones, lets take a stab at those.

1. Is 100% repayment required only if the project is successful? We've clearly answered that one as much as we can.
2. How do national labs and universities participate in applications? Again, I think we've covered that one.
3. Can contingency be included in cost proposals? That's an excellent question.

Tom Russial:

I should defer this one to Bill Mundorf. Short answer is no, contingency is a four letter word in government contracting. Having said that, if the contingency that you're talking about is based on reasonable engineering estimates that could be priced into the breakout the cost, that's something we'd look at. We'd have to evaluate it. But can you put a 20% added on the bottom as contingency on all costs? No, that won't be accepted.

Mike:

I'd like to punctuate that. The objective is to get an application that identifies fair expected cost of the proposed activity. How you choose to create the estimate, you have to have some sophistication in order to develop a viable estimate. Years ago, for example, Rand did a study on pioneer plants and the experience of first-of-a-kind units, like many of the ones we're thinking about, and what the industry experience was. Well, taking that into consideration and generating a viable estimate to me would be prudent, and presenting it in a fashion that could be recognized as "allowable" as opposed to just a "tag on" fat at the bottom for no particular reason. However, I think there is an appreciation of how that should be done. We don't want a low-ball estimate that would not be accepted. As Sharon explained, our amount is fixed in the beginning and then if

we did pick you, we would expect performance. We've asked for overrun coverage, so there's no benefit to low-balling that I see. Contingency, I would convert that around to be fair cost estimate and I think that's what Tom is saying.

4. Can mercury or CO_2 reductions be accepted as credits toward repayment? I think I'd like for just a little bit of clarification on that one before we chew on that. So if the interested party can clarify a bit?

Audience:
If we had a mercury control technology demonstration that went for 2 or 3 years for example, because the utility has no regulatory requirement to decrease it's mercury currently or over that period, it's maintaining costs that it doesn't need to cover. However, could they somehow, within the repayment scheme, get some kind of credit for that because the marginal cost to the utility and the developers are relatively low for that extra 2 years or 3 year demonstration.

Tom Russial:
As far as repayment stands, it's cash. That's the short answer.

Tom Sarkus:
If you could find somebody to sell them to we'd take the money. I understand what you're saying. They're putting the effort forward when they don't have to but…last year I think it was, I was being interviewed by a reporter and sometimes these journalists all this technology stuff is new to them, and the question came up because it was implicit in her question that industry does and should control pollution to the maximum extent that is technically feasible so I'm explaining the profit motive and things like that. But she asked a pointed question. She said "Do you know of any examples of industry controlling emissions before they have to?" Now I don't have encyclopedic knowledge but we do have a couple of examples in the clean coal program where that has happened. Again, it's where there's DOE cost-sharing present. One of those cases was with the Bailey scrubber that I managed up in Indiana, where it was facing a 1995 SO_2 compliance

deadline and we started scrubbing in 1992, fully three years before the compliance deadline. One of the representatives from NIPSCO at that time, told me that we didn't realize when we started this, but the goodwill we've created with our community and service territory far exceeds what we've put into this. I see you shaking your head, that's what I was told. These people worked for the utility. How do you place a dollar value on goodwill? I don't know.

Mike:
Okay, just a process check. We are 10 minutes from the advertised end of the discussion period. I did leave some fat in terms of a wrap up and adjourn so we can probably carry over a little bit. I'm on a path to adjourn cleanly at 3:30. We certainly don't have to stay longer if everybody's got what they need. There might be a few questions that were scope related in terms of this technology or which we've kind of discussed. I'm not sure we could shed more light on that. So at this point I'm going to go back to the open forum setting and you have 20 minutes to make sure you get your moment to ask a question.

Dorothy Maxwell with Terra Industries:
Since the purpose of the whole program is supposed to be advancing technology and sharing the results, since we haven't talked about intellectual property and how the failures and successes of these projects are relayed and what obligations there are for that, could you cover that?

Mike:
Thank you for asking. I'm sure Lisa [Jarr] would love an opportunity to express some viewpoints.

Lisa:
There are obligations that the Department of Energy has to publish the results of the projects that we fund. It's part of the statutes that create the Department of Energy that we are required to disseminate the results of the research projects. Typically, I think one thing, if you're thinking of proposing to the solicitation in this program and you haven't

worked with us before, you do need to take a good look at the intellectual property provisions in the model agreement. We have some flexibility in this program to protect data from publication that would be sensitive or proprietary type data. If you develop it totally at your private expense, we can protect that typically for 5 years after the demonstration program is over. So we try to balance the competing interests of helping you commercialize your technology and be successful in the marketplace with the obligation that we have to publish and make available the results of the work. We try to define as much as possible what will be in the deliverables that are required. There will be a deliverables checklist, certain number of technical and administrative reports, and the technical reports would be intended to be made available. We would ask that we have a clean report that we can release. If there's any sensitive information, either information that you are bringing in as your own proprietary information or information that's generated under the project that you think you'd like to protect, we ask you to put that in a separate appendix so that we still have a releasable report. So that's the way we that we try to kind of balance those objectives. Two different kind of and sometime competing objectives. But in another respect, if we can publicize the work that you've done, especially if it's something that's successful, that's another avenue for you folks to get the word out that you have a good project and some technology that may be valuable to somebody. So we do that, and we put things on our internet, we have an annual conference that we ask people to come and make presentations. So that is part of the strategy here, to get the word out and sometimes when technology doesn't work, unfortunately, as much as what does, both are valuable information to people.

Mike:

Thank you, Lisa. I see we're losing a few folks. Everyone is hanging in there and that's great. Logistics item. Your name tags are recyclable and there is a basket out on the registration table. If you would take a moment to drop that on your way by, it would be appreciated. Questions?

Bob Dalmer, Utilipoint:

As I'm listening to the discussion I seem to be getting a little confused about what you consider a pilot project versus a demonstration project. If we had a concept that, as you're aware, 1/10th scale kind of project is usually good for commercialization path from an insuring perspective. So let's say we have a 25MW scale project, the ultimate goal is to get to 250MW. Would that be considered pilot or demonstration for purposes of this solicitation or should you be ready for the 250 MW type project is what you're looking for. And the other part to my question, a different part of it, is if you are producing some sort of value-added product, like in the Greenbriar case where you're making wood bricks, is the cost of the wood brick portion of the project included in the cost match or is that separate because it's not related to power production? Thank you.

Mike:

Okay, lets take the scale question first and I think you worded it very nicely. So I'll look to the panel. Ken, would you like to take a stab at that?

Ken:

The devil is in the details. You know the concept of 1/10th scale-up is a good rule of thumb and what is often used in the chemical industry is a 100 to one scale-up. I think what you have to do in the proposal is to make a convincing case that this is in fact a commercial demonstration, that it will lead directly to sales of the technology and its use in the marketplace. To sit here and say 1/10th is not good enough, I don't have enough information to say that. Or 50MW isn't. Its really the totality of the proposal. In going back to basic principals, that Mike keeps dragging us back to. Will this show commercial demonstration that will allow it to be taken to the marketplace after the experiment. The second question was, do you separate out products other than electricity if I understood that correctly. Is that part of the cost of the project? Was that the question? In the Greenbrier case the wood brick component is part of the total project. In that project am I right?

Mike:
I'd like to be a little careful about project specific discussion at this point. We have not awarded the Greenbriar agreement so the terms and conditions are still being negotiated as is repayment. So if we could just step back from the specific case and not address that and try to have that in mind, I prefer that we handle that kind of an answer in that way. Do you have a question?

Ken:
Yes and maybe it's more to you than it is to the person from the audience. If the production, the way I understood the question, if the production of the non-electrical product is integral to the performance of the project as a whole, that if you pulled it out it wouldn't be economically or technically viable, is that part in general considered part of the cost share? Is that the question?

Mike:
What I would say is we have a technical interest in some related activities and perhaps not others. We have a by-product utilization program with certain objectives. There are targets in the roadmap. So the degree to which technologies are associated with the demonstration that are also of interest to the stated objectives of the coal R&D program I think those would be fair game to be part of the costs proposed. There are other potential related aspects to a project that may not be of technical interest to this scope of coal RD&D that may work to enhance a particular project that I would say we would have no interest in. But I'll pass that personal perspective down the line to either of the Tom's.

Tom Sarkus:
I was just looking in remarks made this morning, Rita showed a list of technologies that we're interested in for our core R&D program and one of those is by-product utilization. So you know, what you do with the by-product to avoid disposal cost or reduce disposal cost, and otherwise recycle that by-product, is in our mind part of operating a power plant. You could maybe say is ancillary to actually generating the electricity but at the same time it could be something of an Achilles heel. If not an Achilles heel, certainly a

monetary liability. Those can be proposed as part of the project. My experience is, I don't want to say they're not generally that expensive but usually the by-product processing technologies aren't that expensive and we have gotten a lot of goodwill from the by-product type projects that we've undertaken in the past.

Mike:
Let's take a wild example of saying okay there's a project that is barge mounted in an ocean situation where part of the project would be making a lobster field using waste heat for the purposes of managing a lobster business. My personal view is that's really nice, but probably not of interest to the scope of the cost sharing the DOE would be interested in. Any commentary from the board on that one?

Tom Sarkus:
Kind of string into another example with Western Greenbriar and their eco-park. We're investing in the power plant part of the project. We certainly hope and pray that they get lots of tenants in the eco-park but that's not going to be part of our cost sharing for this demonstration. There are boundaries.

Mike:
Conversely though, the environmental analysis, let's say it's an EIS. We're obligated to analyze actions that are directly associated with the conduct of the project. So we may even require environmental information from some of these associated activities, if they are in fact specifically planned as opposed to just an idea, a possibility. But if they're specifically planned as a reasonable expectation of the outcome of doing the demonstration, then I think we have an obligation to analyze it. But again, it's outside the cost sharing scope and data if you will of the demo program.

Tom Sarkus:
We see a lot of times attention, and you have to strike a good balance, on the industrial side I sense sometimes, some participants want to include as much of a project as they can in the project envelope that DOE will then share in funding. And then we kind of put

on our repayment hats and we start talking about a repayment envelope and then we sense that sometimes those very same participants are now trying to narrow what we call the repayment envelope or the innovativeness. So you have to be careful, if you cast it that wide we're going to try to keep it down. You just have to strike a good balance and you have to make good and persuasive arguments. We've talked about a lot of these questions it's like 6 and ½ dozen and you could make a good case and someone else could make an argument that isn't persuasive, that isn't rational, that isn't that strong to us.

Mike:
Let me offer up something at this point. We're very close to the endpoint. I'd like to congratulate you all for hanging in there and being engaged. But if you're walking out with let's say an 80 or 90% satisfaction level for having spent your time, if there's something that comes to mind that you could ask or do that would materially alter that score, I would encourage you to do that. We'll be here after we adjourn if you wanted to talk off line. We're all very approachable. But if you're sitting there and you have a question, thinking, geez I just didn't get what I needed to get from my visit, I want you to make every effort to get that. I want this to be as productive a use of your time as you can possibly make it. Questions?

Dot Johnson, Babcock and Wilcox:
Earlier it was mentioned that we should consider this a zero interest loan but there are real costs that a company incurs, negotiating for 6 months, the reporting, the annual contractors meeting. Will there be any provisions for an early buyout of the repayment obligation? For example, early on the team decides this is a real winner, can we repay the DOE contribution early?

Tom Russial:
Sure!

Mike:
Let me ask a clarification question, though. Was it during the performance of the demonstration project that perhaps in design and procurement things changed such that the participant wanted out of the project at that point?

Dot:
This is a factitious project right now. But somebody had mentioned that you're only going to attract high risk projects. But if you're developing something that there is still risk, but you'd like to propose it and say two years into the demonstration the team decides this is going to be a real winner. Can that team repay DOE and basically terminate the contract?

Mike:
That's what I thought. It was during the performance.

Tom Russial:
That's actually a slightly different question than what we answered. Accelerated repayment is great. There are going to be some provisions that survive the termination of the cooperative agreement that are independent of repayment. The intellectual property provisions are good examples. We have been putting in some requirements for follow-up commercialization reports and I expect we probably would want those independent of repayment. But as far as getting out from under the repayment obligation, sure, you can pay that off anytime and we'll happily take it. But there are some surviving provisions.

Mike:
Tom, wouldn't it be fair to say in that situation let's say that the project was half done and DOE had contributed half of it's intended cost share. The repayment obligation in that case would be what Tom?

Tom:
It would be whatever the amount that DOE contributed at the time the project ended.

Mike:
So not necessarily the full amount intended but what had been expended to some point in time. Other questions?

Doug Todd, Process Power Plants:
In this round, we're facing a potential of another source of money for clean coal and that's in the Senate energy bill. I'm interested in your thoughts about how the two relate, CCPI and the Senate energy bill, as regards the differences as they would apply to a potential application. For instance, in Round 1, I believe you couldn't have money from any other source. If you took CCPI you couldn't have any other. And the timing is very speculative at the moment, your timing and the Senate energy bills. So do you have any comments or have you thought much about what will happen if an applicant comes in for one or the other or both and the different requirements.

Mike:
I'm going to defer to chief councel.

Tom:
That's a good question, Doug. It's a tricky question to answer. You're right. The current requirement for clean coal, for CCPI and the past clean coal projects was the 50% DOE money is all you're going to get. You can't use other federal money to subsidize it. Now the energy bill is an authorization bill, it's not an appropriation act. So there still would have to be appropriations that would come after that. But if there's not specific language that says that it can supplement a program like CCPI, I think we're going to have to read it so that CCPI is still the limit. You get into an interesting issue of conflicting laws but there's fairly specific language dealing with this program. Did that answer your question?

Doug:
I was interested in other conflicts in there. One is timing. Who comes first, which one do you have to apply for first? Can you get an award and then get out of it if the other

one becomes law? One requires repayment, one doesn't. That's a big conflict for people who are thinking about CCPI. Those kinds of issues. If you've been thinking about those, okay. If you haven't, maybe…

Mike:
There are some other issues as you point out that are relevant. I need to go back to Tom's point that it's an authorization bill. So typically in order to spend money there would have to be some associated appropriations, and that provides opportunity for additional guidance and restraints, constraints, whatever have you, that it may be more than it appears in its final form in terms of the conditions that the dollars might become available under. And I think that's something to keep in mind.

Frank Burke, Consol Energy:
If the gentleman is referring to the tax incentive provision in the energy policy bill, I don't know if that's what he's talking about, but the language of at least the last draft that I saw, specifically precludes projects from qualifying for the tax credit if they have accepted CCT or CCPI money. So if that's what he's talking about the conflict between those two is at least addressed in the draft of the Senate language.

Mike:
Yes. In fact this issue of energy tax credits and the relationship to CCPI funding is something that I've actually scheduled an internal meeting to discuss the ramifications of that one perspective. A potential applicant asked us about that and there may be some strategies to deal with what that means relative to potential applicants. But we have not sorted that out ourselves yet. Great question though and thank you for reinforcing that. We do need to spend more time looking at that possibility.

Steve Derene, WE Power:
An earlier slide talked about low-cost as being one of the parameters for measuring or scoring the projects and I was and I guess I still am, confused by what that exactly means. I'm sure everyone who is selling a project says it's low cost, but if we're talking about

producing power from coal it seems to me low cost is not going to be CCPI, it's going to be the old tried and true.

Tom Sarkus:
Generally in looking at an application, we try to evaluate them in terms of three performance factors. Three things you can do to make your power plant better if you will. One, you can improve the efficiency. That would be if everything else stays the same that would be better. Two, you can reduce the emissions. Again, if everything else stays the same, cost doesn't really go up much, the output is the same, that's generally a good thing. And third is, sometimes you may not increase the efficiency, and you may not even reduce the emissions, but you could achieve similar performance at a much lower cost. We run into this a lot with NOx control, because everybody's pointing at SCR. SCR as I stated before usually sets 70-80% NOx reduction but it comes at a cost that's at least 4 or 5 times greater than a low NOx burner. So what if you came up with a new SCR system that again still got 70 or 80% NOx removal but it did it at half the cost. And I think that's what we mean by lower cost. That on balance would be evaluated and considered an improvement over the conventional technology. I don't know, is that clearer?

Steve:
Just a clarification. So if my project was higher cost but had superior efficiency and superior environmental performance it wins on two out of the three and it could be a winning project?

Tom:
Could be. Doesn't have to be but, yes, it certainly could be. Look at IGCC. It's got a platform for higher efficiencies, the emissions are like at $1/10^{th}$ or better than for a PC plant but the capital costs are higher. We hope that they come down. I think they will come down. But yes that would be considered.

Mike:

At the risk of muddling this, I think again we might want to go back to the two branches of the roadmap. There is an advanced energy systems branch that is leading to this future zero emissions plant that has a lower cost profile than today's technology. So if we're talking low cost in the context of an advanced energy system that's one thing. If we're talking low cost in terms of its application to the existing fleet, then it has to be low cost relative to the state-of-the-art if you will for existing fleet control. So low cost takes on a couple of different perspectives. One is busbar cost of electricity and the other is control cost, which relates to tons and dollars per ton controlled.

Tom:

I run into this all the time when people ask me about what's the capital cost of a PC plant versus and IGCC plant. And there are times when I wish people would look at life cycle cost instead of always basing every single decision on capital costs decisions. But the IGCC plant and the PC plant really are not equal. There are reasons why the IGCC plant costs more and one of those reasons is superior environmental performance. It's much better.

Mike:

We are getting quite close and I'm feeling as though the body language is telling me that the audience feels we're pretty much there. So I'll offer it up that I'll take two more questions and then do a brief wrap and send you on your merry way. If there are two. Don't feel obligated. Going once. Gone. I want to again thank you all for making the effort to appear and participate. Again, your thought and participation is quite obvious to us. There are complexities and intricacies that we are committed to continue to look at. I hope you got from today what you hoped to get. There are some thank you's that I'd like to pass along. Folks you probably saw, or even like a good umpire you maybe didn't see them, Carolyn Moore and Betty Robey worked very closely with me to plan the logistics of the conference and I'd like to extend a personal thank you to some excellent work in conference support services. Mike Antkowski is our audio/visual expert and from my perspective it went off without a hitch, and that's certainly quite an accomplishment.

Dave Russell, in the back of the room, works closely with me on programmatic issues and general support getting things on the internet, doing and documenting benefits analysis and the many crazy things I seem to think up at the last minute and I appreciate his continuing support. Hyatt staff, I really found that coming here is just a great venue. It's easy to get to, easy to get out of and their facilities are first class. So all the folks at Hyatt that helped make this a nice experience, I certainly appreciate that. Those are my thank you's for the less visible types. I'd like to thank our keynote speakers. I know Janet has left and Rita I certainly appreciate your comments and hanging in there with us all day. And our panel here, that I think gave you their best. We do work pretty effectively as a team to forge out consensus when we must, but there's a lot of opportunity for debate even amongst ourselves. So I want to thank them. And certainly all of you again for making the effort and why don't we give ourselves a round of applause for a job well done. <Applause.> I'll have the transcripts and the other materials posted on the website as soon as possible, say two weeks. Keep an eye out. Have a safe journey home and we'll be around if you can catch us. Thank you again everyone.